

List of claims

1. (Canceled)
2. (Canceled)
3. (Currently Amended) A synthetic peptide of about 50 to about 90 amino acids, which comprises
 - (a) a helper T cell epitope (Th),
 - (b) an IgE-CH3 domain antigen peptide, wherein said IgE-CH3 domain antigen peptide i) is between about 25 and about 29 amino acids in length ii) contains two cysteine residues separated by about 23 amino acid residues, and iii) is selected from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:84 or an immunologically functional analog thereof, wherein from one to four of the residues in SEQ ID NO:5 is conservatively substituted or deleted; and optionally
 - (c) an immunostimulatory invasin domain, SEQ ID NO: 13.
4. (Canceled) ~~A peptide conjugate comprising a helper T cell epitope sequence (Th) covalently attached to an IgE-CH3 domain antigen peptide, wherein said IgE-CH3 domain antigen peptide i) is between about 25 and about 29 amino acids in length ii) contains two cysteine residues separated by about 23 amino acid residues, and iii) is selected from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:84 or an immunologically functional analog thereof, wherein from one to four of the residues in SEQ ID NO:5 is conservatively substituted or deleted according to claim 1.~~
5. (Currently Amended) A peptide conjugate represented by the formula
$$(A)_n-(\text{IgE-CH3 domain antigen})-(B)_o-(\text{Th})_m-X$$
or
$$(A)_n-(\text{Th})_m-(B)_o-(\text{IgE-CH3 domain antigen})-X$$

wherein

each A is independently an amino acid or a general immunostimulatory sequence an immunostimulatory invasin domain, SEQ ID NO: 13.;

each B is chosen from the group consisting of amino acids, -

NHCH(X)CH₂SCH₂CO-, -NHCH(X)CH₂SCH₂CO(ε-N)Lys-,

-NHCH(X)CH₂S-succinimidyl(ε-N)Lys-, and -NHCH(X)CH₂S-(succinimidyl)-;

each Th is independently a sequence of amino acids that constitutes a helper T cell epitope, or an immune enhancing analog or segment thereof;

IgE-CH3 domain antigen represents the sequence of an IgE-CH3 domain antigen peptide, wherein said IgE-CH3 domain antigen peptide i) is between about 25 and about 29 amino acids in length ii) contains two cysteine residues separated by about 23 amino acid residues, and iii) is selected from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:84 or an immunologically functional analog thereof, wherein from one to four of the residues in SEQ ID NO:5 is conservatively substituted or deleted;

X is an amino acid α-COOH or α-CONH₂;

n is from 0 to about 10;

m is from 1 to about 4; and

o is from 0 to about 10.

6. (Currently Amended) A peptide conjugate represented by the formula

(IgE-CH3 domain antigen)-(B)_o-(Th)_m-(A)_n-X

or

(Th)_m-(B)_o-(IgE-CH3 domain antigen)-(A)_n-X

wherein

each A is independently an amino acid or a general immunostimulatory sequence an immunostimulatory invasin domain, SEQ ID NO: 13

each B is chosen from the group consisting of amino acids, -

NHCH(X)CH₂SCH₂CO-, -NHCH(X)CH₂SCH₂CO(ε-N)Lys-,

-NHCH(X)CH₂S-succinimidyl(ε-N)Lys-, and -NHCH(X)CH₂S-(succinimidyl)-;

each Th is independently a sequence of amino acids that constitutes a helper T cell epitope, or an immune enhancing analog or segment thereof;
IgE-CH3 domain antigen represents the sequence of an IgE-CH3 domain antigen peptide, wherein said IgE-CH3 domain antigen peptide i) is between about 25 and about 29 amino acids in length ii) contains two cysteine residues separated by about 23 amino acid residues, and iii) is selected from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:84 or an immunologically functional analog thereof, wherein from one to four of the residues in SEQ ID NO:5 is conservatively substituted or deleted;
X is an amino acid α -COOH or α -CONH₂;
n is from 0 to about 10;
m is from 1 to about 4; and
o is from 0 to about 10.

7. (Original) A peptide conjugate of any one of claims 4-6 wherein said Th is an SSAL.
8. (Original) A peptide conjugate of any one of claims 4-6 wherein said IgE-CH3 domain antigen peptide has an amino acid sequence selected from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, and SEQ ID NO:84.
9. (Original) A peptide conjugate of claim 7 wherein said IgE-CH3 domain antigen peptide has an amino acid sequence selected from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, and SEQ ID NO:84.
10. (Previously Amended) A peptide conjugate of any one of claims 4-6 wherein said Th has an amino acid sequence selected from the group consisting of SEQ ID NOS: 9-12 and SEQ ID NOS: 61-82 and 89.
11. (Previously Amended) A peptide conjugate of claim 7 wherein said Th has an amino acid sequence selected from the group consisting of SEQ ID NOS: 9-12

and SEQ ID NOS: 60-82 and 89.

12. (Previously Amended) A peptide conjugate of claim 8 wherein said Th has an amino acid sequence selected from the group consisting of SEQ ID NOS: 9-12 and SEQ ID NOS: 60-82 and 89.
13. (Previously Amended) A peptide conjugate of claim 9 wherein said Th has an amino acid sequence selected from the group consisting of SEQ ID NOS: 9-12 and SEQ ID NOS: 60-82 and 89.
14. (Canceled)
15. (Canceled) ~~A peptide conjugate of claim 5 or 6, wherein at least one A is an invasin domain.~~
16. (Currently amended) A peptide conjugate of claim 5 or 6 wherein n is 3, and (A)₃ is (invasin domain, SEQ ID NO: 13)-Gly-Gly.
17. (Canceled) ~~A peptide conjugate of claim 15 wherein said invasin domain has the amino acid sequence of SEQ ID NO:13.~~
18. (Canceled) ~~A peptide conjugate of claim 16 wherein said invasin domain has the amino acid sequence of SEQ ID NO:13.~~
19. (Canceled)
20. (Canceled)
21. (Canceled)
22. (Canceled) ~~A branched polymer comprising a lysine, trilysine, or heptalysine core, covalently attached to two, four, or eight peptide conjugates, respectively, of any one of claims 45-6 or 14.~~
23. (Withdrawn) ~~A polymer comprising one or more peptide conjugates of any one~~

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of claims 45-6 or 14, cross-linked by a bifunctional crosslinking agent.

24. (Currently Amended) A pharmaceutical composition comprising an immunologically effective amount of a peptide or peptide conjugate of any one of claims [4]5-6 or 14, and a pharmaceutically acceptable carrier.
25. (Canceled) A pharmaceutical composition of claim 23, wherein said immunologically effective amount of said peptide or peptide conjugate is between about 0.5 μ g and about 1 mg per kilogram body weight per dose.
26. (Canceled)
27. (Canceled)
28. (Canceled)